

ABSTRACT

A stepped-frequency chirped waveform improves SAR groundmapping for the following reasons. Range resolution in SAR image is inversely proportional to the transmitted signal bandwidth in nominal SAR systems. Since there is a limit in the transmitted bandwidth that can be supported by the radar hardware, there is a limit in range resolution that can be achieved by processing SAR data in conventional manner. However, if the frequency band of the transmitted signal is skipped within a group of sub-pulses and received signal is properly combined, the composite signal has effectively increased bandwidth and hence improvement in range resolution can be achieved. The proposed new and practical approach can effectively extend the limit in range resolution beyond the level that is set by the radar hardware units when conventional method is used.